What Is Claim Is:

1. A process for producing a substrate suitable for use in semi-conductor processing, said process comprising:

a) roughening the surface of the substrate material to produce microfissures therein;

b) treating the roughened surface to remove at least substantially all particles of the substrate material remaining on the roughened surface; and

c) coating the roughened surface with a coating composition containing at least one metal oxide.

2. The process of claim 1 wherein the substrate is comprised of a material selected from the group consisting of quartz, ceramics, metals and metal oxides.

3. The process of claim 1 wherein the coating composition is selected from silicon dioxide, aluminum oxide, zirconium oxide, yttrium oxide and combinations thereof.

4. The process of claim 3 wherein the coating composition comprises zirconium oxide and yttrium oxide.

5. The process of claim 1 wherein the step of coating the roughened surface comprises generating a plasma comprising a plasma generating gas and the coating composition and directing the plasma toward said roughened surface in a manner sufficient to apply the coating composition to the roughened surface.

6. The process of claim 5 further comprising generating the plasma in the presence of compressed air.

7. The process of claim 5 comprising generating the plasma at a temperature of from about 10,000 to 30,000°F.

8. The process of claim 5 wherein the plasma generating gas is selected from the group consisting of hydrogen, nitrogen, argon, helium and mixtures thereof.

9. The process of claim 1 wherein the step of roughening the surface of the substrate material comprises:

a) contacting the substrate material with solid particles of a roughening material to produce a surface roughness in the range of from about 180 to 320 micro inch Ra.

10. The process of claim 9 wherein the surface roughness is 200-300 micro inch Ra.

11. The process of claim 1 wherein the step of treating the roughened surface comprises immersing the substrate in a high concentration, strong acid containing immersion bath.

12. The process of claim 11 wherein the concentration of the strong acid is from 15 to 50 volume percent.

13. The process of claim 11 wherein the concentration of the strong acid is from 25 to 35 volume percent.

14. The process of claim 11 wherein the immersion bath comprises nitric acid and hydrofluoric acid.

15. The process of claim 11 further comprising removing the substrate from the immersion bath and cleaning the substrate.

16. The process of claim 1 wherein the depth of the microfissures is up to about 0.005 inch.

17. The process of claim 1 wherein the depth of the microfissures is up to about 0.006 inch.

18. The process of claim 1 wherein the thickness of the coating is sufficient to fill and cover the microfissures.

19. The process of claim 18 wherein the thickness of the coating is up to about 0.010 inch.

20. The process of claim 1 wherein the step of coating the roughened surface comprises applying the coating composition in the form of a plasma containing a plasma gas.

21. The process of claim 20 comprising applying the coating composition in the form of a plasma at a temperature of from 10,000°F to 30,000°F.

22. The process of claim 1 wherein the coating is a dielectric coating.